

This safety data sheet has been prepared in accordance with the requirements of EC Directive 88/379/EEC and 91/155/EEC (and other related directives) and provides information relating to the safe handling and use of the product.

1. PRODUCT AND COMPANY INFORMATION

Product Code	0120665
Trade Name	603
Manufacturer/Supplier	Loctite UK
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Phone Number	01 707 358800
Fax Number	01 707 358900
Emergency Phone Number	+353-1-4599301/+353-1-87-2629625/+353-1-4046444

2. COMPOSITION / INFORMATION ON INGREDIENTS

Nature Product based on polyethyleneglycol dimethacrylate.

Hazardous Components in Product for EC

Component Name	Concentration	R Phrases	Classification
4-T-Butylcyclohexyl Methacrylate	30.00 - 60.00	R37	Xi
Acrylic acid	5.00 - 10.00	R10, R21/22, R35, R50	C, N
1,3 Butylene Glycol Dimethacrylate	5.00 - 15.00	R36/37/38	Xi
Hydroxypropyl Methacrylate	5.00 - 10.00	R36, R43	Xi
1-Acetyl-2-phenylhydrazine	0.10 - 0.50	R20/21/22, R40, R38, R43	Xn
Octylphenoxypoly (Ethoxy) Ethanol	1.00 - 3.00	R22, R41	Xn
Cumene Hydroperoxide	0.10 - 1.00	R7, R21/22, R23, R34, R48/20/22, R51/53	O, T, N

3. HAZARD IDENTIFICATION

Causes burns. Irritating to respiratory system. May cause sensitisation by skin contact.

4. FIRST AID MEASURES

First Aid - Inhalation

Should not be a problem as product is of low volatility. However, if feeling unwell remove patient to fresh air.

First Aid - Skin

Wash with plenty of soap and water. If irritation persists, seek medical advice.

First Aid - Eyes

Flush eyes immediately with plenty of water for at least 15 minutes. Seek medical attention immediately.

First Aid - Ingestion

Give plenty of water to drink. Do not induce vomiting. Obtain medical attention.

5. FIRE FIGHTING MEASURES

Non flammable product (flash point is greater than 100°C (CC)). Trace amounts of toxic fumes may be released on incineration and the use of breathing apparatus is recommended. If product is involved in fire extinguish with dry powder, foam or carbon dioxide.

6. ACCIDENTAL RELEASE MEASURES

Wear protective clothing and suitable respiratory protection. Contain spillage, and absorb onto an inert absorbent such as sand or multisorb and place in a sealed container for supervised disposal.

7. HANDLING AND STORAGE

Handling

Use in well ventilated area. Loctite applicators are recommended to minimise skin contact, particularly where workers are handling sharp or threaded parts which might result in microlaceration of sensitive areas of the skin. Avoid contact with skin and eyes.

Storage

Store in original containers at 8°C-21°C and do not return residual materials to containers as contamination may reduce the shelf life of the bulk product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure limits**Acrylic acid**

HSA (1999) C.O.P : OEL 10ppm (30mg/m³) 8h TWA.
HSA (1999) C.O.P : OEL 20ppm (60mg/m³) 15 min
exposure limit.

Use in well ventilated area. Avoid contact with skin, eyes and clothing. Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid.
Colour	Green.
Odour	Characteristic.
pH	Not determined.
Boiling Range/Point (°C)	Not determined.
Flash Point (CC) (°C)	> 100
Specific Gravity	1.05.
Solubility in Water (kg/m³)	Immiscible.
Solubility in Acetone	Miscible
Vapour Pressure (mmHg @25°C)	Less than 3 at 20 °C.
Explosion Limits (%)	Not determined.

10. STABILITY AND REACTIVITY

Non reactive to water. Non reactive to oxidising agents except for peroxides. Destabilised by reducing agents.

11. TOXICOLOGICAL INFORMATION

Inhalation

May cause irritation to respiratory system.

Skin

Causes burns to skin. Acute dermal LD50 (rabbit) is estimated to be greater than 2000mg/kg. May cause sensitisation by skin contact.

Eyes

This product is an irritant to the eyes.

11. TOXICOLOGICAL INFORMATION

Ingestion

This product is considered to be of low toxicity having an acute oral LD50 (rat) >2000mg/kg by analogy to other similar products.

12. ECOLOGICAL INFORMATION

Does not contain substances listed on the Montreal protocol.

13. DISPOSAL CONSIDERATIONS

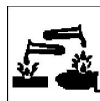
Dispose of in accordance with local and national regulations. Standard procedures for 'water insoluble' non-toxic chemicals recommended.

14. TRANSPORT INFORMATION

UN Number	1760
Air (IATA)	Corrosive liquid n.o.s., Class 8, Pkg. Grp. III.
Sea (IMO)	Corrosive liquid, n.o.s., Class 8, Pkg. Grp. III. EmS 8-15 MFAG 760.
Road (ADR)/Rail (RID)	Corrosive liquid, n.o.s., Class 8, Item no. 66° (c), Label 8.

15. REGULATORY INFORMATION

Contains Acrylic acid. Hydroxypropyl Methacrylate Cumene Hydroperoxide

Labelling Information

Corrosive

R phrases

R34 Causes burns.
R43 May cause sensitisation by skin contact.
R37 Irritating to respiratory system.

S phrases

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28 After contact with skin, wash immediately with plenty of soap and water. S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S51 Use only in well ventilated areas.

Voluntary Labelling

N/A

16. OTHER INFORMATION

MSDS first issued	12 February 1996
MSDS data revised	31 May 2000

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Further Information may be obtained from:-

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16. OTHER INFORMATION

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Fax: +353-1-4510806.

The information in this safety data sheet was obtained from reputable sources and to the best of our knowledge is accurate and current at the mentioned date. Neither Loctite nor its subsidiary companies accept any liability arising out of the use of the information provided here or the use, application or processing of the product(s) described herein. Attention of users is drawn to the possible hazards from improper use of the product(s).

This safety data sheet was prepared in accordance with Commission Directive 98/98/EC adapting to technical progress for the 25th time Council Directive 67/548/EEC.

Supersedes Safety Data Sheet No: 3 dated 04/11/98.

PRODUCT DESCRIPTION

LOCTITE® Product 603 is a single component anaerobic retaining adhesive for cylindrical joints. The product cures when confined in the absence of air between close fitting metal surfaces. This product develops adhesion even on surfaces lightly contaminated with oil.

TYPICAL APPLICATIONS

Used to bond cylindrical fitting parts, particularly where consistently clean surfaces cannot be assured. Applications include retaining roller bearings or oil impregnated bushings into housings.

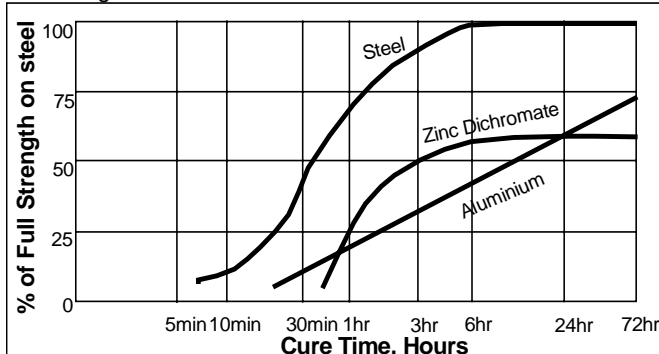
PROPERTIES OF UNCURED MATERIAL

	Value	Typical Range
Chemical Type	Urethane Methacrylate	
Appearance	Green, fluorescent	
Specific Gravity @ 25°C	1.1	
Viscosity @ 25°C, mPa.s (cP)		
Brookfield RVT		
Spindle 1 @ 20 rpm	125	100 to 150
DIN 54453, MV		
D = 277 s ⁻¹ after t=180secs	135	90 to 180
Flash Point (TCC), °C	>93	

TYPICAL CURING PERFORMANCE

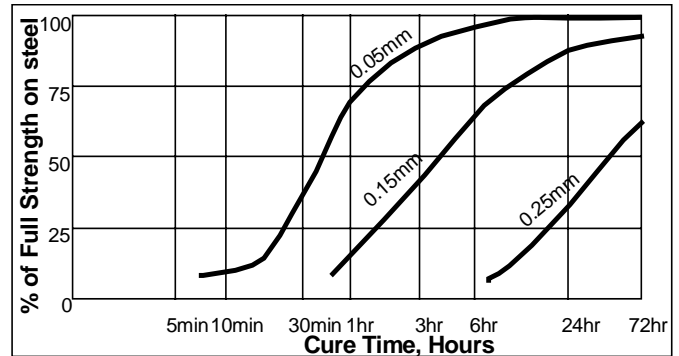
Cure speed vs. substrate

The rate of cure will depend on substrate used. The graph below shows shear strength developed with time on steel pins and collars compared to different materials and tested according to ISO 10123.



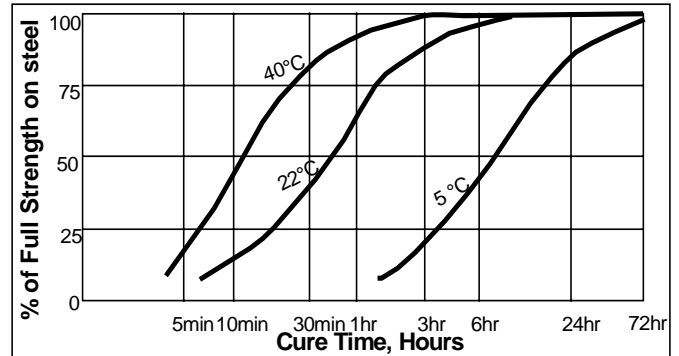
Cure speed vs. bond gap

The rate of cure will depend on the bondline gap. The following graph shows shear strength developed with time on steel pins and collars at different controlled gaps and tested according to ISO 10123.



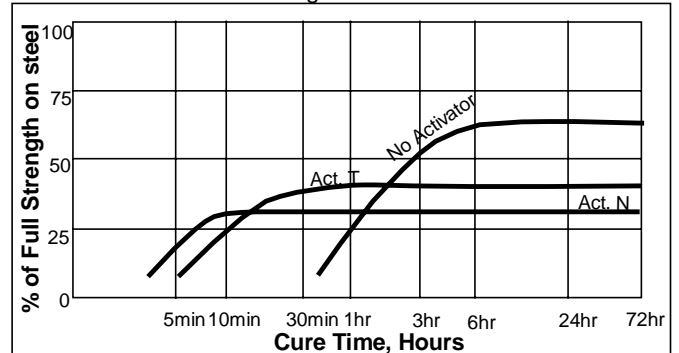
Cure speed vs. temperature

The rate of cure will depend on the ambient temperature. The graph below shows shear strength developed with time on steel pins and collars at different temperatures and tested according to ISO 10123.



Cure speed vs. activator

Where cure speed is unacceptably long, or large gaps are present, surface activation will improve cure speed. The graph below shows shear strength developed with time using ACTIVATOR T and N on zinc dichromated steel pins and collars and tested according to ISO 10123.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Coefficient of thermal expansion, ASTM D696, K ⁻¹	80 x 10 ⁻⁶
Coefficient of thermal conductivity, ASTM C177, W.m ⁻¹ K ⁻¹	0.1
Specific Heat, kJ.kg ⁻¹ K ⁻¹	0.3

PERFORMANCE OF CURED MATERIAL

(After 24 hr at 22°C on steel)

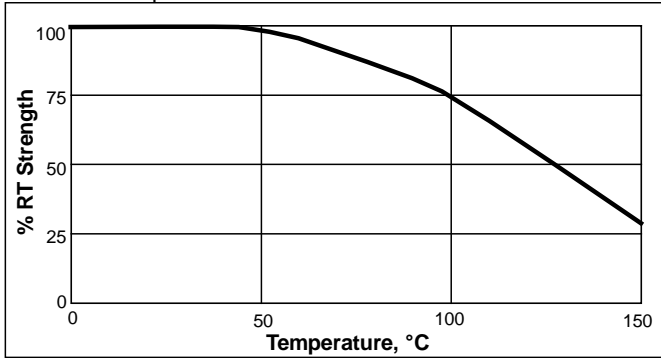
	Value	Typical
		Range
Shear Strength, ISO 10123, N/mm ² (psi)	26 (3770)	20 to 32 (2900 to 4600)
Shear Strength, DIN 54452, N/mm ² (psi)	20.5 (3000)	16 to 25 (2300 to 3600)

TYPICAL ENVIRONMENTAL RESISTANCE

Test Procedure : Shear Strength, ISO 10123
 Substrate: Steel Pins and Collars
 Cure procedure: 1 week at 22°C

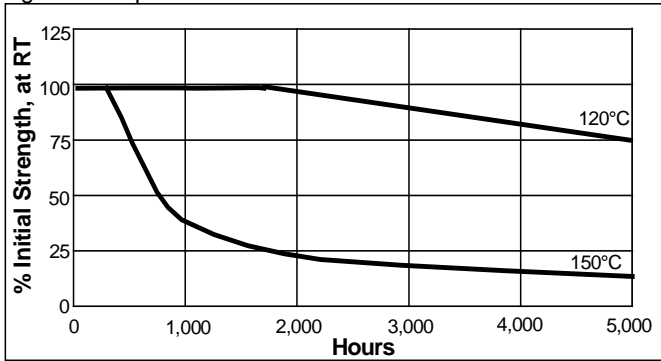
Hot Strength

Tested at temperature.



Heat Ageing

Aged at temperature indicated and tested at 22°C.



Chemical / Solvent Resistance

Aged under conditions indicated and tested at 22°C.

Solvent	Temp.	% Initial Strength retained at		
		100 hr	500 hr	1000 hr
Motor Oil	125°C	100	100	100
Unleaded Petrol	22°C	100	90	85
Brake Fluid	22°C	100	90	80
Water/Glycol (50%/50%)	87°C	100	90	80
Ethanol	22°C	100	100	75
Acetone	22°C	90	90	90

GENERAL INFORMATION

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidising materials.

For safe handling information on this product, consult the Material Safety Data Sheet, (MSDS).

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

This product is not normally recommended for use on plastics (particularly thermoplastic materials where stress cracking of the plastic could result). Users are recommended to confirm compatibility of the product with such substrates.

Directions for use

For best performance surfaces should be clean and free of grease. Ensure joint is completely filled with adhesive. For slip fitted assemblies this is achieved by applying adhesive around the pin and the leading edge of the collar and using a rotating motion during assembly to ensure good coverage. For press fitted assemblies adhesive should be applied thoroughly to both bond surfaces and assembled at high press on rates. For shrink fitted assemblies the adhesive should be coated onto the pin, the collar should then be heated to create sufficient clearance for free assembly. Parts should not be disturbed until sufficient handling strength is achieved. This grade has the ability to cure through thin films of most protective oils. Some oils contain rust inhibitors (e.g. sodium nitrate) which will chemically inhibit the adhesive cure. Cure speed and final strength on oiled surfaces will be affected, depending on the type and amount of oil used. For more detailed information on using retaining adhesives contact your local technical service centre.

Storage

Product shall be ideally stored in a cool, dry location in unopened containers at a temperature between 8°C to 28°C (46°F to 82°F) unless otherwise labelled. Optimal storage is at the lower half of this temperature range. To prevent contamination of unused product, do not return any material to its original container. For further specific shelf life information, contact your local Technical Service Centre.

Data Ranges

The data contained herein may be reported as a typical value and/or range (based on the mean value ±2 standard deviations). Values are based on actual test data and are verified on a periodic basis.

Note

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, Loctite Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Loctite Corporation's products. Loctite Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits. The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a licence under any Loctite Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.